**Topics 09 – Redox Chemistry (SL/HL 1)**

**Topic 9: Oxidation and reduction (7 hours)**  
**9.1 Introduction to oxidation and reduction - 2 hours**   
9.1.1 Define oxidation and reduction in terms of electron loss and gain. (1)   
9.1.2 Deduce the oxidation number of an element in a compound. (3)   
9.1.3 State the names of compounds using oxidation numbers. (1)   
9.1.4 Deduce whether an element undergoes oxidation or reduction in reactions using oxidation numbers. (3)   
**9.2 Redox equations - 1 hour**   
9.2.1 Deduce simple oxidation and reduction half-equations given the species involved in a redox reaction. (3)   
9.2.2 Deduce redox equations using half equations. (3)   
9.2.3 Define the terms oxidizing agent and reducing agent. (1)   
9.2.4 Identify the oxidizing and reducing agents in redox equations. (2)   
**9.3 Reactivity - 1 hour**   
9.3.1 Deduce a reactivity series based on the chemical behavior of a group of oxidizing and reducing agents. (3)   
9.3.2 Deduce the feasibility of a redox reaction from a given reactivity series. (3)   
**9.4 Voltaic cells - 1 hour**   
9.4.1 Explain how a redox reaction is used to produce electricity in a voltaic cell. (3)   
9.4.2 State that oxidation occurs at the negative electrode (anode) and reduction occurs at the positive   
electrode (cathode). (1)   
**9.5 Electrolytic cells - 2 hours**   
9.5.1 Describe, using a diagram, the essential components of an electrolytic cell. (2)   
9.5.2 State that oxidation occurs at the positive electrode (anode) and reduction occurs at the negative   
electrode (cathode). (1)   
9.5.3 Describe how current is conducted in an electrolytic cell. (2)   
9.5.4 Deduce the products of the electrolysis of a molten salt. (3)   
  
  
**Topic 19: Oxidation and reduction (5 hours)**  
**19.1 Standard electrode potentials - 3 hours**   
19.1.1 Describe the standard hydrogen electrode. (2)   
19.1.2 Define the term standard electrode potential (E ) Ö . (1)   
19.1.3 Calculate cell potentials using standard electrode potentials. (2)   
19.1.4 Predict whether a reaction will be spontaneous using standard electrode potential values. (3)   
**19.2 Electrolysis - 2 hours**   
19.2.1 Predict and explain the products of electrolysis of aqueous solutions. (3)   
19.2.2 Determine the relative amounts of the products formed during electrolysis. (3)   
19.2.3 Describe the use of electrolysis in electroplating.